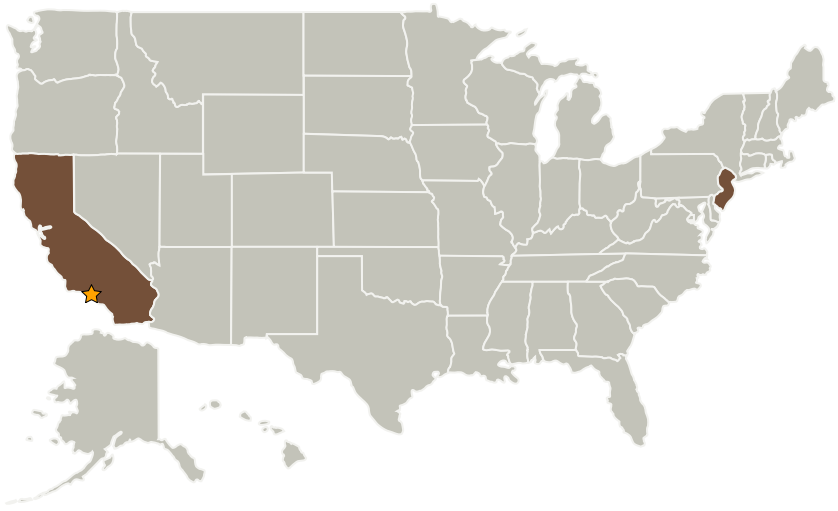
Low Permeation Envelope Material Development for Titan Aerobot, Phase I

Completed Technology Project (2004 - 2004)

Project Introduction

Aerobot vehicles for missions on Titan require envelope materials that are strong, light and durable. Unlike terrestrial balloon materials, these must be able to withstand flexing at temperatures of 90K without developing pinhole leaks. To meet this requirement, it is proposed to use Lamart?s experience in lightweight laminated sailcloth and ultra light film lamination to create a material for this application. This will be a laminated combination of multiple thin films and fabric. Test capabilities will be created and correlated to those already done at NASA-JPL. Literature search and sample testing will determine the appropriate film, adhesive, fibers, and fabric weave. Further testing will determine the minimum manageable film thickness and the minimum amount of adhesive needed to meet the mission requirements. Laminations of multiple layers of thin film will be tested to determine the benefit of this schedule compared to single layer equivalent films. Small quantities of the most promising film and fabric laminate designs will be produced on a narrow width laminator that duplicates the process used to produce full sized products and tested for flex durability.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
Lamart Corporation	Supporting Organization	Industry	Clifton, New Jersey

Primary U.S. Work Locations	
California	New Jersey

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Evan Chu

Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.3 Thermal Protection Components and Systems
    - TX14.3.1 Thermal Protection Materials